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The examination is being carried out on the following application documents:

Description, Pages

1-22 as originally filed

Claims, Numbers

1-26 as originally filed

Drawings, Sheets

1/10-10/10 as originally filed

The following documents are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

D1: EP-A-0 831 660 (AT&T) 25 March 1998 (1998-03-25)

D2: EP-A-0 833 517 (AT&T) 1 April 1998 (1998-04-01)

D3: PLOYSONGSANG A ET AL: "DCT/DPCM PROCESSING OF NTSC COMPOSITE VIDEO SIGNAL" IEEE TRANSACTIONS ON COMMUNICATIONS, vol. COM-30, no. 3, 1 March 1982 (1982-03-01), pages 541-549, XP002062314 ISSN: 0090-6778

D4: MUSMANN H G ET AL: "ADVANCES IN PICTURE CODING" PROCEEDINGS OF THE IEEE, vol. 73, no. 4, April 1985 (1985-04-01), pages 523-548, XP002057834



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Document D3 has been cited in the search report, while documents D1, D2 and D4 are cited by the examiner (see the Guidelines, C-VI, 8.7). A copy of each of these additional documents is annexed to the communication.

1. Lack of unity (Article 82 EPC)

The application lacks unity within the meaning of Article 82 EPC for the following reasons:

The common concept between independent claim 1 and independent claim 24 is: predictive coding of DC transform coefficients based on the spatial correlation between the quantized DC value of the block to be predicted and the quantized DC values of a plurality of neighboring blocks of the block to be predicted.

The concept above, with the exception of the comparison between quantized DC values, is not novel, since D3 discloses an adaptive prediction of DCT transform coefficients, using 4 neighboring blocks to the block to be predicted, the neighboring block of which the DC value is closest to that of the block to be predicted being considered to have the maximum correlation and hence being selected as the predictor. The fact that the correlation is computed between quantized DC values is a trivial difference with respect to the prediction disclosed in D3, and therefore cannot be regarded as the inventive concept linking the subject-matter of claim 1 and that of claim 24.

Hence the examiner considers that the following separate inventions or groups of inventions are not so linked as to form a single general inventive concept:

(A) claims 1-4, 17-23:

adaptive intraframe predictive coding of DC coefficients based on DC gradients computed between neighboring blocks of the block to be coded

(B) claims 5-16, 24-26:

object-based video coding involving padding of object boundary blocks and adaptive intraframe prediction of DC coefficients.

The subject-matter of each of the separate inventions solves a distinct problem,



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therefore it differs from that of the other without there being any unifying novel concept common to both (see the Guidelines, C-III, 7.7, fifth sentence).

Since the applicant has not indicated on which invention searched by the search division the prosecution of the application should be based, no complete examination can be carried out for the time being (see Guidelines, C-III, 7.11). The applicant is asked to state upon which invention prosecution of this application should be based and to limit the application accordingly. The other invention is to be excised from the claims, description and drawings (Rule 34(1)(c) EPC).

The subject-matter to be excised may be made the subject of divisional applications. The divisional applications must be filed directly at the European Patent Office in Munich or its branch at The Hague and in the language of the proceedings relating to the present application, see Article 76(1) and Rule 4 EPC.

Although a complete examination is not possible, comments about the first invention (A) above are made in the following points for the sake of expediency of the procedure. The second invention (B) is not examined here. It is however suggested that the applicant amend independent claim 24 in such a way as to link its subject-matter to that of the first invention (A).

2. Lack of clarity (Article 84 EPC)

The application does not meet the requirements of Article 84 EPC, because dependent claims 3, 4, 17 and 23 are not clear.

In claims 3, 4, 17 and 23, the reader is left in doubt as to the location of the neighboring blocks B1, B2 and B3 of the block B to be coded, which are to be selected among at least 8 potential neighboring blocks. This renders the definition of the subject-matter of said claims unclear (Article 84 EPC).

3. Lack of novelty in the sense of Article 54(3) and (4) EPC



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- 3.1 The European patent application EP1997307378 (corresponding to D1) published on 25.03.1998 claims the priority dates of 20.09.1996, 14.02.1997 and 11.08.1997.

The priority document with the earliest priority date is a US provisional application (US26963 P). According to the Notice from the President of the European Patent Office dated 26.01.1996 (OJ EPO 1996, 81) concerning the priority conferring effect of the US "provisional application for patent", this provisional application gives rise to a right of priority within the meaning of Article 87(1) EPC.

The content as filed in D1 discloses in particular :
a block based video coding method, wherein predictive coefficients are selected depending on the difference between quantized DC gradients of a plurality of neighboring blocks of a block to be coded (page 3 line 51 - page 4 line 1, figures 2,3 and 5).

This particular content is entitled to the earliest priority date (see the following passages in the US provisional application mentioned above : page 2 lines 2, 6-9, section 2.1 "DC prediction Improvement" on pages 3 and 4, figures 2(a) and 3). It is therefore considered as comprised in the state of the art relevant to the question of novelty, pursuant to Article 54(3) and (4) EPC.

Thus, it is prejudicial to the novelty of the subject-matter of claim 1 of the present application insofar as the same Contracting States DE, FR and GB are designated.

This lack of novelty also applies to the subject-matter of claims 2-4 (see in D1 page 3 line 51 - page 4 line 11, figures 2,3 and 5).

- 3.2 The European patent application EP1997307141 (corresponding to D2) published on 01.04.1998 claims the priority dates of 25.09.1996 and 07.03.1997.



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The same reasoning as before is applicable to this second earlier application : the earliest priority document is US provisional application US27436 P; the content disclosed in D2, column 7 line 50 - column 8 line 12, column 8 lines 22-36, and figures 8-10 is entitled to the earliest priority date (see in the above US provisional application the following passages : section 3.2.3.1 "QuantX Method 1 : Quantization and DCT coefficient predictions" on page 4 and figures 4(a) and 5(a)) and discloses the subject-matter of claims 1-4.

3.3 Therefore, the subject-matter of claims 1-4 of the present application is not novel insofar as the same Contracting States DE, FR and GB are designated.

4. Lack of inventive step of independent claim 1 (Article 56 EPC)

The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claim 1 does not involve an inventive step in the sense of Article 56 EPC.

The document D3 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses :

a block based video coding method (lines 6-8 of the abstract), wherein predictive coefficients are selected depending on the difference between DC gradients of a plurality of neighboring blocks of a block to be coded (page 542, right column, lines 35-38; page 544, left column, lines 1-8; figure 5).

The subject-matter of claim 1 therefore differs from this known D3 in that the difference is computed on quantized DC gradients, in which case the transform coefficients undergo first quantization then prediction, instead of first prediction then quantization. The skilled person would immediately recognize that this merely represents an alternative coding method, the order of these quantization and prediction operations being irrelevant to the general predictive coding principle.

Consequently, the subject-matter of claim 1 does not involve an inventive step.



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5. Lack of inventive step of dependent claims 2-4, 17-23 (Article 56 EPC)

Dependent claims 2-4 and 17-23 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the EPC with respect to inventive step, the reasons being as follows:

5.1 The same reasoning as in point 4. applies for claim 2.

5.2 The subject-matter of claims 3 and 4 further differs from D3 in that the DC gradient is computed between neighboring blocks of the block to be predicted, i.e. without any reference to the block to be coded, and the selection of the predictive DC value for the block to be coded is selected as the DC value of the neighboring block yielding the largest DC gradient of the two DC gradients being computed. From these additional distinguishing features, the objective problem to be solved by the present application may be regarded as performing adaptive intraframe prediction without any overhead information being transmitted (contrariwise, the adaptive prediction of D3 requires the transmission of additional information to indicate which neighbor has been selected as the predictor, as mentioned in D4, page 542 left column, paragraph before last).

The solution proposed in claims 3 and 4 of the present application cannot be considered as involving an inventive step (Articles 52(1) and 56 EPC): document D4 discloses Graham's adaptive prediction principle, which involves computation of gradients between neighbors and selection as predictor of the neighbor for which the gradient is the largest (see D4, page 534 left column lines 4-30, figure 18). This principle is applied to pixel prediction in D4. The skilled person confronted with the objective problem above would consider Graham's principle, which is said to avoid the transmission of additional information (see D4, page 534 left column lines 19-23), and would apply it to the prediction of the DC coefficient of the block to be coded without the exercise of inventive skill. In doing so, the skilled person would then arrive to the claimed solution in an obvious manner.

5.3 The additional features present in claims 17-23 concern the normalisation of the



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DC coefficients when the quantization step sizes of the block to be coded and of the neighboring blocks are different. They would be obvious to the person skilled in the art trying to solve the problem of how to perform the prediction in the case of different quantization step sizes used for the blocks.

6. Final remarks

- 6.1 To meet the requirements of Rule 27(1)(b) EPC, document D3 should be identified in the description and its relevant content should be indicated.
- 6.2 To meet the requirements of Rule 29(1) EPC the independent claim should be properly cast in the two-part form, with those features which in combination are part of the prior art (document D3) being placed in the preamble (Rule 29(1)(a) EPC) and with the remaining features being included in the characterising part (Rule 29(1)(b) EPC).
- If the applicant is of the opinion that a two-part form of the claim would be inappropriate he is invited to provide reasons in his reply. In addition, the applicant should ensure that it is clear from the description which features of the subject-matter of the independent claim are known from D3 (Rule 27(1)(b) EPC, see also the Guidelines C-III, 2.3).
- 6.3 The applicant is requested to file new claims which take account of the above comments.
- 6.4 In order to facilitate the examination of the conformity of the amended application with the requirements of Article 123(2) EPC, the applicant is requested to clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based.

If the applicant regards it as appropriate these indications could be submitted in handwritten form on a copy of the relevant parts of the application as filed.

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